



ARGIBUSINESS

August 24, 2016

Arthur Burbank  
USDA Forest Service  
4350 South Cliffs Dr.  
Pocatello, ID 83204

**Subject: Biological Selenium Removal Treatment Technology  
Fluidized Bed Bioreactor Pilot Study  
July 2016 Progress Report**

Dear Art,

This progress report summarizes key activities in July 2016 associated with the fluidized bed bioreactor (FBR) pilot study located near Hoopes Spring. This pilot study is being conducted as part of the Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS) to provide information on the effectiveness of the active biological treatment system in removing selenium and other COPCs from South Fork Sage Creek Springs and Hoopes Spring. Operation and monitoring of the pilot study follows the *Pilot Study Work Plan and Sampling and Analysis Plan (Work Plan/SAP), Biological Selenium Removal Treatment Technology Fluidized Bed Bioreactor* (prepared by Formation Environmental, dated September 2014, with revised text and tables dated March 5, 2015), along with Work Plan/SAP Addenda 01 through 04.

Weekly sample collection during the 12-week performance testing period was completed on June 28, after which sampling has been conducted every other week. The system is currently operational, and samples collected during the month of July were analyzed for the focused analyte list only, as specified in the Work Plan/SAP.

The following sampling events were conducted in July 2016:

- Week 13 sampling on July 6; and
- Week 15 sampling on July 20.

#### **Identification of Deliverables and Data Transmittals**

At the time of this report, the 12-week performance testing has been completed, and laboratory data for Weeks 13 and 15 of the every other week testing period have been received. Preliminary laboratory data are presented in Table 1. Field data for Weeks 11 through 12 of the performance testing period and Week 13 of the every other week testing period are presented in Table 2.

There were no outstanding deliverables or transmittals for the month of July.

### Upcoming Activities

The following activities associated with the FBR pilot study are planned through August 2016:

- As per the Work Plan/SAP, sample collection will continue every other week (focused analyte list only). This phase of sampling began on July 6.
- Preparation of the Work Plan/SAP for Phase 2 of the FBR treatability study, which includes addition of reverse osmosis and an increase in treatment system flow capacity.

Please contact me if there are questions regarding this monthly progress report.

Sincerely,



Monty Johnson  
Environmental Engineering Manager

cc: Arthur Burbank – USDA Forest Service, 410 East Hooper, Soda Springs, ID 83276 (2 copies)  
Sherri Stumbo – USDA Forest Service, 4350 South Cliffs Dr., Pocatello, ID 83204  
Rick McCormick – CH2M, 322 East Front St., Suite 200, Boise, ID 83702 (2 copies)  
Wayne Crowther – IDEQ, 444 Hospital Way, Suite 300, Pocatello, ID 83201  
Colleen O'Hara-Epperly – BLM, 4350 South Cliffs Dr., Pocatello, ID 83204  
Matt Wilkening – USEPA, 950 W. Bannock St., Suite 900, Boise, ID 83702  
Sandi Fisher – FWS, 4425 Burley Dr., Suite A, Chubbuck, ID 83202  
Kelly Wright – Shoshone-Bannock Tribes, P.O. Box 306, Fort Hall, ID 83203  
Susan Hanson – (b) (6), Pocatello, ID 83202  
Gary Billman – IDL, 3563 East Ririe Highway, Idaho Falls, ID 83401  
Doug Scott – CH2M, 59 Lilac Court, Pagosa Springs, CO 81147  
Alan Prouty – J.R. Simplot Company, P.O. Box 27, 999 Main St., Suite 1300, Boise, ID 83707  
Burl Ackerman – J.R. Simplot Company, P.O. Box 27, 999 Main St., Suite 1300, Boise, ID 83707  
Chad Gentry – J.R. Simplot Company, P.O. Box 1270, Afton, WY 83110  
Rachel Roskelley – J.R. Simplot Company, P.O. Box 1270, Afton, WY 83110  
Dennis Facer – J.R. Simplot Company, 1130 W. Highway 30, P.O. Box 912, Pocatello, ID 83204  
Fred Charles – Formation Environmental, 2500 55<sup>th</sup> St., Boulder, CO 80301

**Table 1**  
**Laboratory Results Focused Analyte List**

Biological Selenium Removal Treatment Technology  
 Fluidized Bed Bioreactor

		Week 13		Week 15	
		Influent	Effluent	Influent	Effluent
	Station >>	SC0716-LSSHS-IN001	SC0716-LSSHS-EF001	SC0716-LSSHS-IN002	SC0716-LSSHS-EF002
	Sample ID >>	7/6/2016	7/6/2016	7/20/2016	7/20/2016
Analyte	Date >>				
	Units				
<b>General Chemistry</b>					
Nitrate as N	mg/L	0.43	0.14	0.34	0.08
Total Phosphorus as P	mg/L	0.0201	0.0878	0.0196	0.136
Total Sulfide	mg/L	1 U	1 U	1 U	1 U
<b>Metals and Metalloids</b>					
Selenium, Dissolved	mg/L	0.123	0.00535	0.116	0.00454
Selenium, Total	mg/L	0.126	0.00545	0.123	0.00483

**Notes:**

Results presented are preliminary, and have not been validated at the time of this report.

U - Analyte not detected above the method detection limit (MDL).

J - Result is estimated.

**Table 2**  
**Field Water Quality Data**

Week 11	Station >>	Influent	Effluent
	Sample ID >>	SC0616-LSSHS-IN004	SC0616-LSSHS-EF004
	Date >>	6/21/2016	6/21/2016
Analyte	Units		
Dissolved Oxygen	mg/L	8.74	7.49
ORP	mV	170	146
pH	SU	7.31	6.66
SC	umhos/cm	452	479
Temperature	C	13.59	12.92
Turbidity	NTU	2	6

Week 12	Station >>	Influent	Effluent
	Sample ID >>	SC0616-LSSHS-IN005	SC0616-LSSHS-EF005
	Date >>	6/28/2016	6/28/2016
Analyte	Units		
Dissolved Oxygen	mg/L	8.6	7.59
ORP	mV	181	191
pH	SU	7.27	6.81
SC	umhos/cm	446	488
Temperature	C	13.64	12.81
Turbidity	NTU	2	6.6

Week 13	Station >>	Influent	Effluent
	Sample ID >>	SC0716-LSSHS-IN001	SC0716-LSSHS-EF001
	Date >>	7/6/2016	7/6/2016
Analyte	Units		
Dissolved Oxygen	mg/L	8.68	7.6
ORP	mV	198	170
pH	SU	7.21	6.69
SC	umhos/cm	464	478
Temperature	C	13.49	12.78
Turbidity	NTU	1.8	10.6